

US EPA ARCHIVE DOCUMENT



The Clear Skies Act of 2003

Connecticut and Clear Skies



Highlights of Clear Skies in Connecticut

- **Connecticut sources would reduce emissions of SO₂ by 15%, NO_x by 6%, and mercury by 23% by 2020 due to Clear Skies.**
- **The health benefits in Connecticut would total \$1.1 billion annually (\$220 million under the alternative estimate) and include approximately 100 fewer premature deaths (90 under the alternative estimate) and 300 fewer hospitalizations/emergency room visits each year.**
- **In addition, Connecticut would receive environmental benefits including improved visibility and reduced nitrogen and sulfur deposition.**
- **Clear Skies does not significantly impact electricity prices. With or without Clear Skies, electricity prices in the electricity supply region that includes Connecticut are expected to remain below 2000 prices.**

Clear Skies: An Innovative Approach to Improving Human Health and the Environment

Why Clear Skies?

- **Air quality has improved, but serious concerns persist**
 - Connecticut's citizens suffer ill effects from air pollution, including asthma attacks and premature death
- **Electricity generation sector remains a major emissions source**
 - Very cost-effective to control the power sector, relative to other sources
 - Sources are concerned about upcoming complex and burdensome regulations

Advantages of the Clear Skies Approach

- **Guarantees significant nationwide emissions reductions – beginning years before full implementation**
 - Connecticut sources would reduce emissions of SO₂, NO_x and mercury
 - Delivers dramatic progress towards achievement of critical health and environmental goals
- **Uses proven, market-based flexible approach with incentives for innovation**
 - Recognizes environmental needs as well as industry constraints, allowing industry to better manage its operations and finances while lowering risks to the public
 - Sources are projected to install pollution controls to enable continued reliance on coal
- **Increases certainty across the board for industry, regulators, and consumers**

Under Current Clean Air Act Power Plants Would Face a Complex Set of Requirements

NSR Permits for new sources & modifications that increase emissions

Ozone

1-hr Serious Area Attainment Date

OTC NO_x Trading

NO_x SIPs Due

Designate areas for 8-hr Ozone NAAQS

1-hr Severe Area Attainment Date
NO_x SIP Call Reductions

Marginal 8-hr Ozone NAAQS Attainment Date

8-hr Ozone Attainment Demonstration SIPs due

Assess Effectiveness of Regional Ozone Strategies

Possible Regional NO_x Reductions ? (SIP call II)¹

Moderate 8-hr Ozone NAAQS Attainment Date

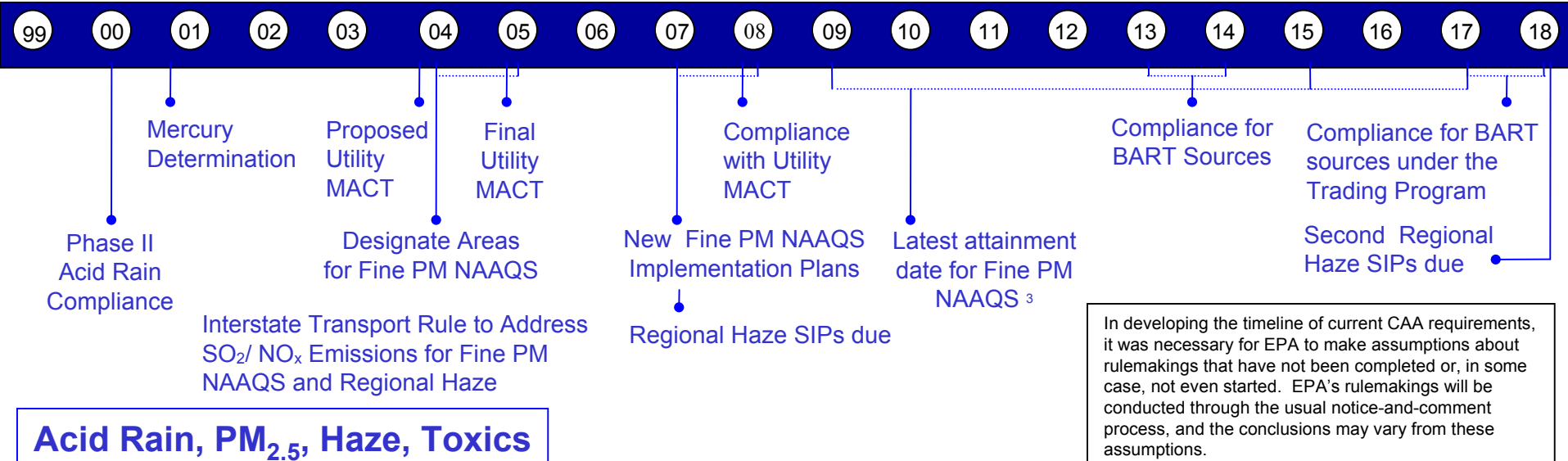
Note: Dotted lines indicate a range of possible dates.

¹ Further action on ozone would be considered based on the 2007 assessment.

² The SIP-submittal and attainment dates are keyed off the date of designation; for example, if PM or ozone are designated in 2004, the first attainment date is 2009

EPA is required to update the new source performance standards (NSPS) for boilers and turbines every 8 years

Serious 8-hr Ozone NAAQS attainment Date



Clear Skies Sets a Firm Timeline for Emission Reductions

2004: The NO_x SIP call (summertime NO_x cap in 19 Eastern States + D.C.)

→ **2004**

The existing Title IV SO₂ cap-and-trade program provides an incentive and a mechanism to begin reductions upon enactment of Clear Skies years before regulatory action under the current Act.

2008: Clear Skies NO_x Phase I (2.1 million ton annual cap assigned to two Zones with trading programs)

→ **2008**

2010: Clear Skies Hg Phase I (26 ton annual cap with a national trading program)

2010

2010: SO₂ Phase I (4.5 million ton annual cap with a national trading program)

2018: Clear Skies NO_x Phase II (1.7 million ton annual cap assigned to two Zones with trading programs)

→ **2018**

2018: Clear Skies Hg Phase II (15 ton annual cap with a national trading program)

2018: Clear Skies SO₂ Phase II (3.0 million ton annual cap with a national trading program)

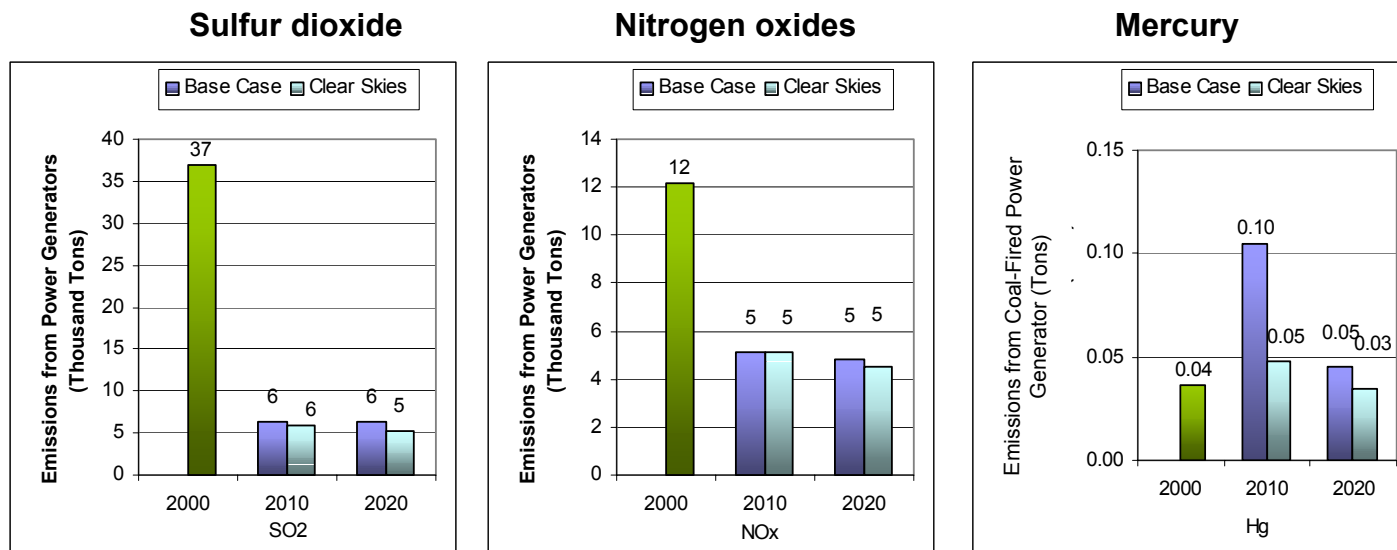
Emissions in Connecticut with Clear Skies

Emissions in Connecticut (2020) would be significantly reduced from 2000 levels:

- 86% reduction in SO₂ emissions
- 63% reduction in NO_x emissions
- 3% reduction in mercury emissions

These reductions are mostly attributable to Connecticut's state requirements.

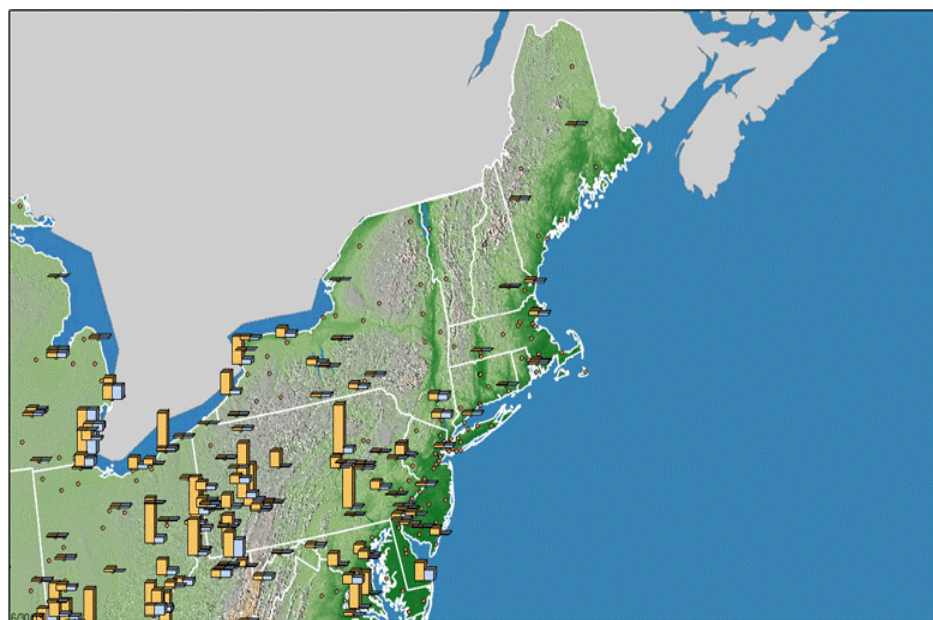
**Emissions: Current (2000) and Existing Clean Air Act Regulations (base case*)
vs. Clear Skies in Connecticut in 2010 and 2020**



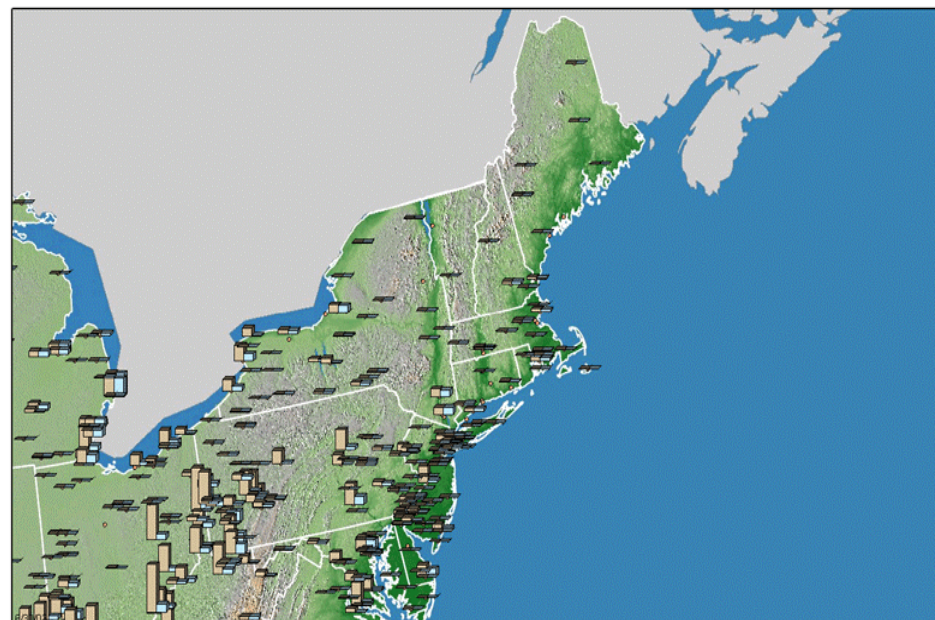
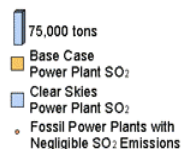
Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

Emission Reductions under Clear Skies

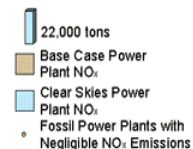
Emissions in states surrounding Connecticut would decrease considerably. These emission reductions would make it much easier for Connecticut to comply with the national air quality standards.



Projected SO₂ Emissions from Power Plants with the Base Case and Clear Skies (2020)
Northeast



Projected NO_x Emissions from Power Plants with the Base Case and Clear Skies (2020)
Northeast



Note: The base case in IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated. Emissions projected for new units in 2020 are not reflected.

Clear Skies Health Benefits in Connecticut

Improve Public Health

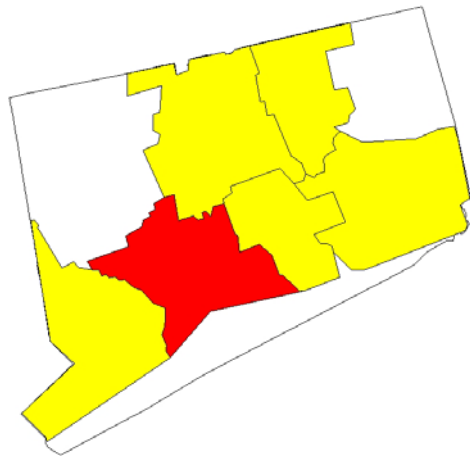
- **Reduced ozone and fine particle exposure** by 2020 would result in public health benefits of:
 - approximately 100 fewer premature deaths each year¹
 - approximately 90 fewer cases of chronic bronchitis each year
 - approximately 300 fewer non-fatal heart attacks each year
 - approximately 300 fewer hospital and emergency room visits each year
 - approximately 16,000 fewer days workers are out sick due to respiratory symptoms each year
 - approximately 1,400 fewer school absences each year
- **Reduced mercury emissions** would reduce exposure to mercury through consumption of contaminated fish, resulting in additional, unquantified benefits for those who eat fish from Connecticut's rivers and lakes.

By 2020, Connecticut would receive approximately \$1.1 billion in annual health benefits from reductions in fine particle and ozone concentrations alone due to Clear Skies.¹

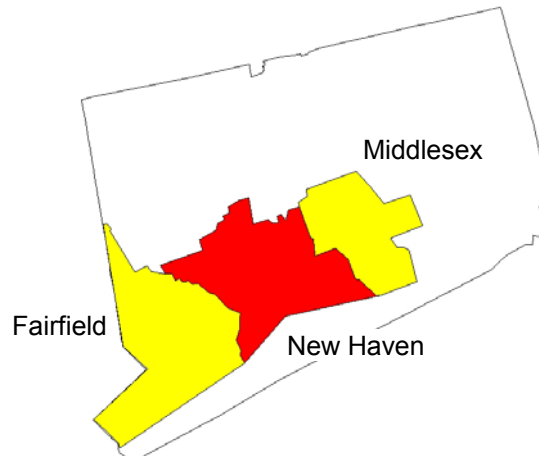
1. An alternative methodology for calculating health-related benefits projects approximately 90 premature deaths prevented and \$220 million in health benefits each year in Connecticut by 2020.

Counties Projected to Remain Out of Attainment with the PM_{2.5} and Ozone Standards in Connecticut

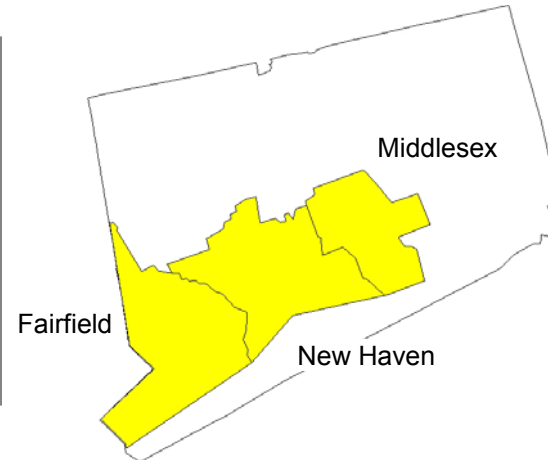
Current Conditions



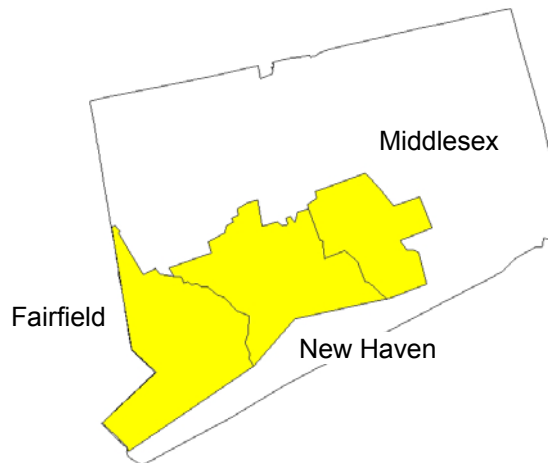
2010 Base Case



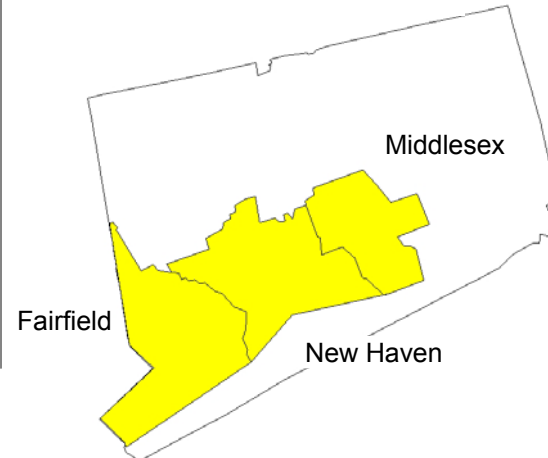
2020 Base Case






2010 Clear Skies



2020 Clear Skies



Legend

-  out of attainment with the 8-hour ozone standard only
-  out of attainment with the annual fine particle standards only
-  out of attainment with both standards

Note: The base case includes Title IV, the NO_x SIP Call, the Tier II, Heavy-Duty Diesel, and Nonroad Diesel rules, final NSR settlements as of early spring 2003, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Based on 1999-2001 data of counties with monitors that have three years of complete data.

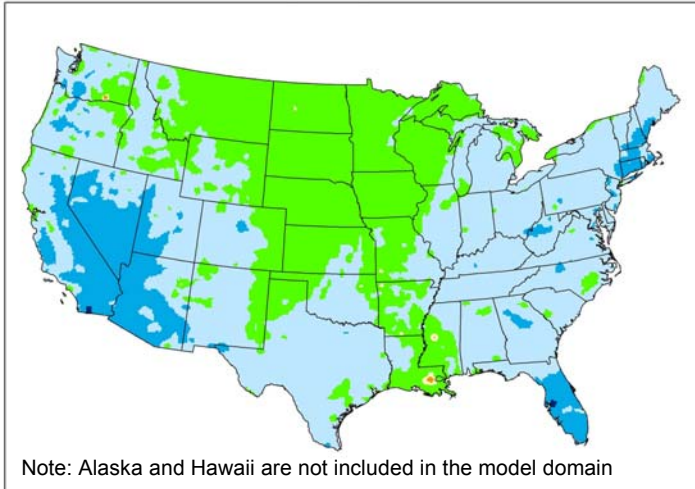
Clear Skies Would Help Connecticut Meet Air Quality Standards

- Currently there is 1 county exceeding the annual fine particle standard and 6 counties exceeding the 8-hour ozone standard.
 - Some of these counties are expected to be brought into attainment under existing programs.
- **Clear Skies would significantly improve air quality in Connecticut** further and more quickly than what is expected from existing programs.
 - By 2010, Clear Skies would bring New Haven County (population approximately 800,000) into attainment with the annual fine particle standard.
- In addition, Clear Skies would reduce ozone and fine particle concentrations in counties throughout the state and move some of the remaining non-attainment counties in Connecticut (Middlesex, New Haven, and Fairfield) closer to attainment with the ozone standard.

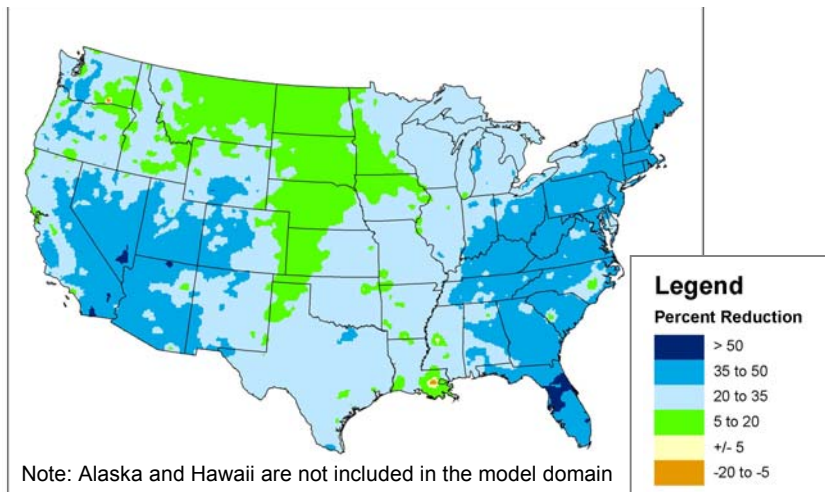
Note: Based on 1999-2001 data of counties with monitors that have three years of complete data.

Clear Skies Environmental Benefits in Connecticut

Projected Changes in Nitrogen Deposition in Connecticut with the Base Case in 2020 Compared to 2001



Projected Changes in Nitrogen Deposition in Connecticut with Clear Skies and the Base Case in 2020 Compared to 2001



Clear Skies Would Provide Substantial Environmental Benefits in Connecticut

In comparison to existing programs,

- Visibility would improve perceptibly along the Connecticut coast.
 - The value of improved visibility for Connecticut residents who visit National Parks and Wilderness areas nationwide would be \$41 million each year by 2020.
- Nitrogen deposition to the Long Island Sound watershed would be reduced by up to 20% beyond what is expected under the Base Case.
- Sulfur deposition, a primary cause of acid rain, would decrease by 15-30%.
- Mercury deposition would decrease by up to 5% across much of the state and up to 15% in some areas of western Connecticut.*

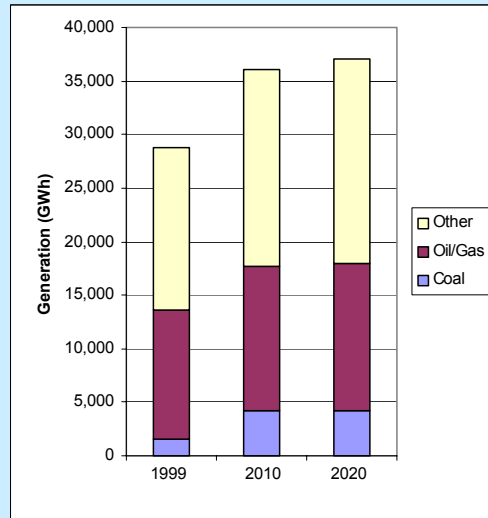
* These results are based on modeling the Clear Skies mercury cap without triggering the safety valve.

Electricity Generation and Pollution Controls in Connecticut with Clear Skies

- Connecticut's electricity growth is projected to be met by increases in gas-fired and coal-fired generation. Clear Skies does not significantly alter this projection.

- Electricity from coal-fired generation will increase by 175% from 1999 to 2020.

Current and Projected Generation by Fuel Type in Connecticut with Clear Skies (GWh)



- Connecticut's sources are projected to reduce their emissions through the use of existing pollution controls, rather than through a switch from coal to natural gas.

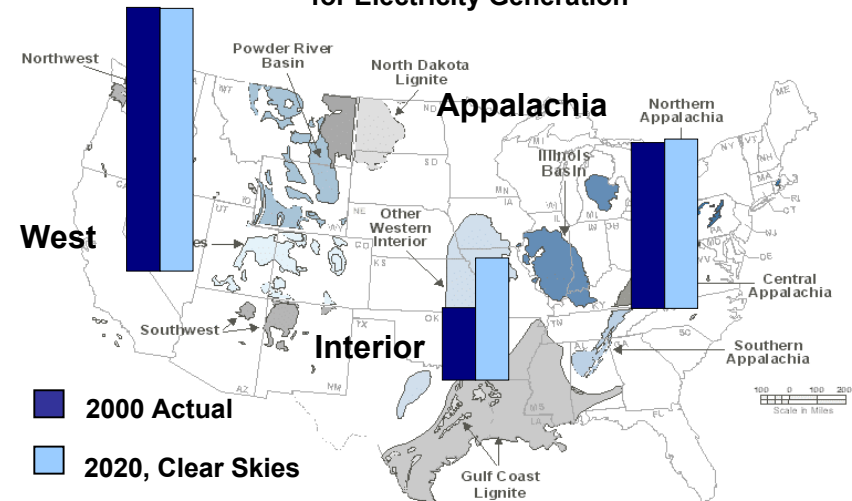
- In 2010 and 2020, 100% of Connecticut's coal-fired generation is projected to come from units with advanced SO₂ and/or NO_x control equipment that also substantially reduce mercury emissions.
- No pollution controls are projected to be installed in Connecticut under Clear Skies.
- No coal-fired units in Connecticut are projected to be removed from operation as a result of Clear Skies.

- The major generation companies in Connecticut include:

- NRG Energy
- Wisvest-Connecticut
- AES NUGs

- Total coal-fired capacity in Connecticut is projected to be 574 MW in 2010

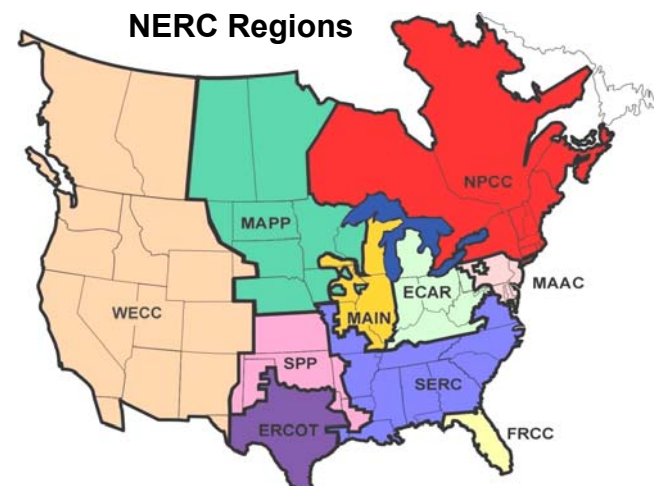
Current and Projected Coal Production for Electricity Generation



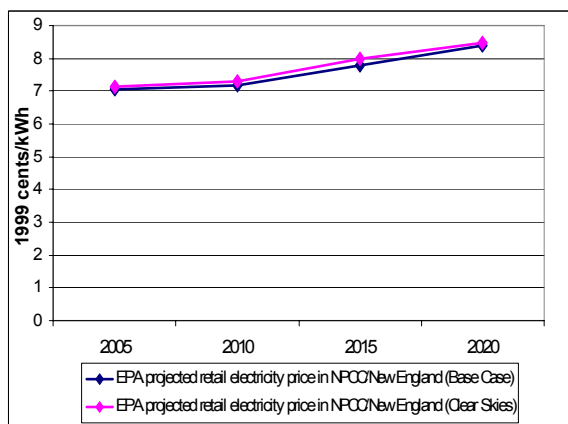
Scale: Appalachia 2000 = 299 million tons

Electricity Prices in Connecticut with Clear Skies

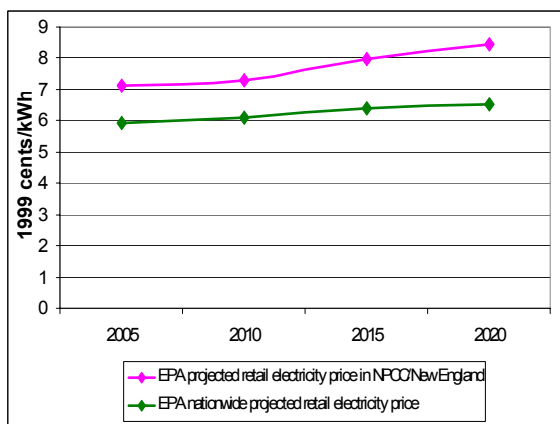
- With or without Clear Skies, retail prices in the North American Electric Reliability Council (NERC) NPCC region (the electricity supply region that contains Connecticut) are projected to increase between 2005 and 2020.
- With Clear Skies, retail prices are projected to be approximately 0.5 – 2.7% higher between 2005 and 2020 than in the absence of the legislation.



Projected Retail Electricity Prices in Connecticut under the Base Case and Clear Skies (2005-2020)



Projected National Retail Electricity Prices and Prices in Connecticut under Clear Skies (2005-2020)



In 2000, the average retail electricity price in Connecticut was approximately 9.5 cents/kWh, which was above the average *national* retail price of approximately 6.7 cents/kWh.

Note: The base case using IPM includes Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in CT, MA, MO, NC, NH, TX, and WI. It does not include mercury MACT in 2007 or any other potential future regulations to implement the current ambient air quality standards or other parts of the Clean Air Act. Base case emissions in 2020 will likely be lower due to state and federal regulatory actions that have not yet been promulgated.

Costs and Benefits in Connecticut with Clear Skies

Benefits Outweigh the Costs

- **In Connecticut, Clear Skies is projected to cost approximately \$74 million annually by 2020 while providing health benefits totaling approximately \$1.1 billion annually.**
- **The increases in production costs under Clear Skies represent only a small percentage of total retail electricity sales revenue in Connecticut.**
 - Retail electricity sales revenue in Connecticut was almost \$2.8 billion in 2000.
 - Adjusting these sales revenues by the same growth rate used for the modeling of costs would result in revenues of \$4.3 billion annually in 2020.
- **Nationwide, the projected annual costs of Clear Skies (in \$1999) are \$4.3 billion in 2010 and \$6.3 billion in 2020; the nationwide benefits of Clear Skies are expected to be over \$113 billion annually by 2020.**
 - An alternate estimate projects annual health benefits totaling \$23 billion.

Clear Skies....

- **Guarantees significant emissions reductions – beginning years before full implementation**
- **Uses a proven and flexible market-based approach with incentives for innovation**
- **Increases certainty across the board for industry, regulators, and consumers**

Note: Costs include capital costs, fuel, and other operation and maintenance costs (both fixed and variable) associated with the achievement of the emissions caps in the legislation (for example, the installation and operation of pollution controls). These state-level production costs are estimates; they do not account for the costs associated with the transfer of electricity across regions, nor the costs or savings that could be associated with allowance movement between sources.

Notes on EPA's Analysis

- The information presented in this analysis reflects EPA's modeling of the Clear Skies Act of 2003.
 - EPA has updated this information to reflect modifications:
 - Changes included in the Clear Skies Act of 2003.
 - Revisions to the Base Case to reflect newly promulgated rules at the state and federal level since the initial analysis was undertaken.
 - The Clear Skies modeling results presented include the safety valve feature
 - This analysis compares new programs to a Base Case (Existing Control Programs), which is typical when calculating costs and benefits of Agency rulemakings.
 - The Base Case reflects implementation of current control programs only:
 - Does not include yet-to-be developed regulations such as those to implement the National Ambient Air Quality Standards.
 - The EPA Base Case for power sector modeling includes:
 - Title IV, the NO_x SIP Call, NSR settlements, and state-specific caps in Connecticut, Massachusetts, Missouri, New Hampshire, North Carolina, Texas, and Wisconsin finalized before March 2003.
 - For air quality modeling, the Base Case also includes federal and state control programs, as well as the Tier II, Heavy Duty Diesel, and Non-Road Diesel rules.
- **For more information regarding the Clear Skies Act, please visit the EPA website:**

(<http://www.epa.gov/clearskies>)

